

Appl. No.: 10/664,148  
Filed: September 17, 2003  
Page 2

Amendments to the Claims:

1. (Original) A method of forming a composite article from composite fiber tape, the method comprising:
  - irradiating at least one fiber tape with a laser diode array;
  - compacting the irradiated fiber tape against a workpiece such that the fiber tape conforms to the contour of the workpiece and is adhered thereto;
  - inspecting the fiber tape and producing an output representative of at least one characteristic of the fiber tape; and
  - automatically altering at least one system parameter defining an operational characteristic of the method based on the output.
2. (Original) The method of forming a composite article of Claim 1 wherein inspecting the fiber tape comprises inspecting images of the fiber tape after the fiber tape has been compacted.
3. (Canceled)
4. (Original) The method of forming a composite article of Claim 1 wherein inspecting the fiber tape comprises detecting the tack of the resin of the fiber tape before compacting the fiber tape against the workpiece, and wherein automatically altering at least one system parameter comprises automatically altering the temperature of the fiber tape before compacting the fiber tape against the workpiece based on the tack of the resin of the fiber tape.
5. (Original) The method of forming a composite article of Claim 1 wherein inspecting the fiber tape produces an output representative of at least one characteristic of the fiber tape, the characteristics selected from the group consisting of temperature of the fiber tape, temperature of the workpiece, rate of placement of the fiber tape, compaction

Appl. No.: 10/664,148  
Filed: September 17, 2003  
Page 3

pressure, tack of the fiber tape, and placement of the fiber tape relative to another fiber tape.

6. (Original) The method of forming a composite article of Claim 1 wherein automatically altering at least one of the system parameters comprises automatically altering at least one system parameter selected from the group consisting of temperature of the fiber tape, temperature of the workpiece, rate of placement of the fiber tape, compaction pressure, tack of the fiber tape, and placement of the fiber tape relative to another fiber tape.

7. (Original) The method of forming a composite article of Claim 1 further comprising:

measuring the temperature in a plurality of sensing zones on at least one of the fiber tape and the workpiece; and

automatically and independently irradiating a plurality of irradiation zones in accordance with the measured temperature.

8. (Original) The method of forming a composite article of Claim 1 further comprising marking an area of the fiber tape to indicate a defect based on the inspection of the fiber tape.

9. (New) A method of forming a composite article from composite fiber tape, the method comprising:

irradiating at least one fiber tape with a laser diode array;

compacting the irradiated fiber tape against a workpiece such that the fiber tape conforms to the contour of the workpiece and is adhered thereto;

inspecting the fiber tape and producing an output representative of at least one characteristic of the fiber tape; and

automatically altering at least one system parameter defining an operational characteristic of the method based on the output,

Appl. No.: 10/664,148  
Filed: September 17, 2003  
Page 4

wherein inspecting the fiber tape comprises measuring the molecular mobility of a resin of the fiber tape.

10. (New) The method of forming a composite article of Claim 9 wherein inspecting the fiber tape comprises inspecting images of the fiber tape after the fiber tape has been compacted.

11. (New) The method of forming a composite article of Claim 9 wherein inspecting the fiber tape comprises detecting the tack of the resin of the fiber tape before compacting the fiber tape against the workpiece, and wherein automatically altering at least one system parameter comprises automatically altering the temperature of the fiber tape before compacting the fiber tape against the workpiece based on the tack of the resin of the fiber tape.

12. (New) The method of forming a composite article of Claim 9 wherein inspecting the fiber tape produces an output representative of at least one characteristic of the fiber tape, the characteristics selected from the group consisting of temperature of the fiber tape; temperature of the workpiece, rate of placement of the fiber tape, compaction pressure, tack of the fiber tape, and placement of the fiber tape relative to another fiber tape.

13. (New) The method of forming a composite article of Claim 9 wherein automatically altering at least one of the system parameters comprises automatically altering at least one system parameter selected from the group consisting of temperature of the fiber tape, temperature of the workpiece, rate of placement of the fiber tape, compaction pressure, tack of the fiber tape, and placement of the fiber tape relative to another fiber tape.

Appl. No.: 10/664,148  
Filed: September 17, 2003  
Page 5

14. (New) The method of forming a composite article of Claim 9 further comprising:  
measuring the temperature in a plurality of sensing zones on at least one of the  
fiber tape and the workpiece; and  
automatically and independently irradiating a plurality of irradiation zones in  
accordance with the measured temperature.
15. (New) The method of forming a composite article of Claim 9 further comprising  
marking an area of the fiber tape to indicate a defect based on the inspection of the fiber  
tape.